State of California

AIR RESOURCES BOARD

RECOMMENDED AREA DESIGNATIONS FOR THE 2008 FEDERAL LEAD STANDARD

STAFF REPORT

Release Date: August 26, 2009
Hearing Date: September 24, 2009

California Environmental Protection Agency

Air Resources Board

TABLE OF CONTENTS

Page

BACKGROUND 1

LEAD AIR QUALITY TRENDS 1

RECOMMENDED AREA DESIGNATIONS 3
- Nonattainment Area 6
- Attainment Area 6
- Unclassifiable Areas 7

MONITORING REQUIREMENTS 7

SUMMARY 10

LIST OF FIGURES AND TABLES

Page

FIGURE 1: Maximum 30-Day Average Lead Concentrations in California 2

FIGURE 2: Recommended Area Designations for the 2008 Federal Lead Standard 4

FIGURE 3: California Counties in Core Based Statistical Areas that Must Sample for Lead 9

TABLE 1: Recommended California Area Designations for the Federal Lead Standard Based on 2006-2008 Air Quality Data 5

TABLE 2: Core Based Statistical Areas in California with a Population of 500,000 or More 8

BACKGROUND

The purpose of this report is to summarize the staff's area designation recommendations for the revised federal lead standard. This report also discusses the new federal lead monitoring requirements.

On October 15, 2008, U.S. EPA revised the federal ambient air quality standard for lead, lowering it from 1.5 micrograms per cubic meter ($\mu g/m^3$) to 0.15 $\mu g/m^3$ for both the primary and the secondary standard. U.S. EPA determined that numerous health studies are now available that demonstrate health effects at much lower levels of lead than previously thought. U.S EPA subsequently published the final rule in the Federal Register on November 12, 2008 (http://www.epa.gov/fedrgstr/EPA-AIR/2008/November/Day-12/a25654.pdf). This is the first time that the federal lead standard has been revised since it was first issued in 1978.

In addition to revising the level of the standard, U.S. EPA changed the averaging time from a quarterly average to a rolling three-month average. The level of the standard is "not to be exceeded" and is evaluated over a three-year period. Lead levels are measured as lead in total suspended particulate, or TSP. The revised lead standard also includes new monitoring requirements.

Under the Clean Air Act, all states are required to develop recommendations for area designations and appropriate boundaries. These initial recommendations for lead must be submitted to U.S. EPA by October 15, 2009. U.S. EPA has one year to review the recommendations, promulgating final area designations by October 15, 2010. State implementation plans are due 18 months after U.S. EPA makes the final designations. An area must attain the lead standard within five years of the nonattainment designation.

Although states are required to make area designation recommendations, U.S. EPA recognizes that the current lead sampling network is not adequate in all areas, including California. As a result, U.S. EPA may take an additional two years to designate areas with insufficient data. During this time, new lead samplers will be deployed to collect the data needed to resolve unclassifiable designations.

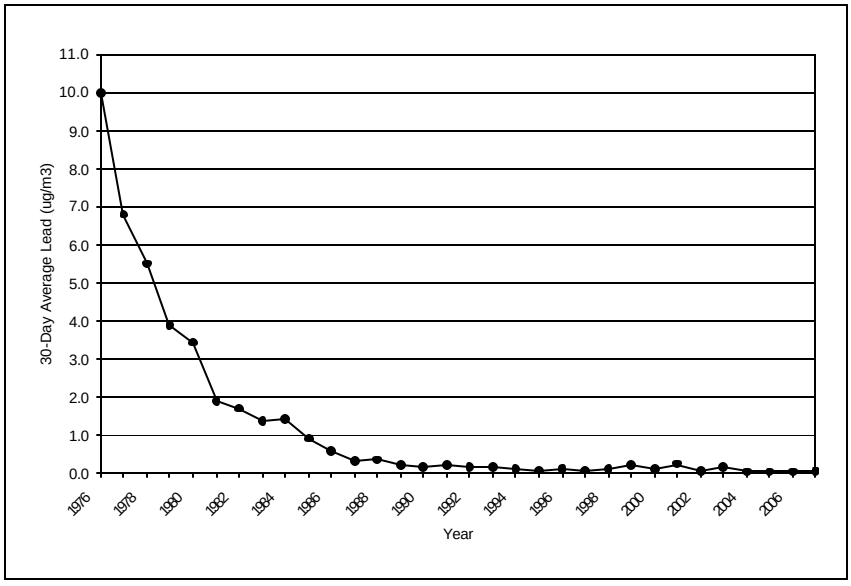
LEAD AIR QUALITY TRENDS

When U.S. EPA adopted the lead standard in 1978, it was estimated that over 90 percent of ambient lead concentrations were attributable to the use of lead in gasoline. The U.S. EPA required a monitoring network be established to include at least two permanent monitors in all urban areas with a population of 500,000 or more. By requiring monitors in urban areas, the regulation was designed to provide information on the major source of lead (gasoline fuel), as well as to

provide information on population exposure to ambient lead concentrations. California's lead monitoring program predated federal requirements by many years. California began monitoring in the late 1960s, and continued to expand the monitoring network in the 1970s and into the early 1980s.

The phase-out of lead in gasoline began during the 1970s, and subsequent ARB regulations virtually eliminated lead from the gasoline sold in California (except for very limited use in general aviation applications). Figure 1 shows the dramatic drop in lead concentrations since 1975 in California's urban areas. Although lead from gasoline no longer poses an air quality problem, lead emissions from remaining industrial sources (not reflected in Figure 1) can still pose "hot spot" problems in a few locations.

FIGURE 1
Maximum 30-Day Average Lead Concentrations in California



Note that the graphed data reflect the maximum 30-day average lead concentration, which is not directly comparable with the rolling 3-month average specified in the federal standard. Generally, the maximum 30-day average is higher than the maximum rolling 3-month average.

As lead concentrations dropped dramatically and all areas of California attained the previous standard, most lead monitors were shut down by the early 1990s and resources deployed to other pollutants. As a result, there is insufficient monitoring data to determine designations, and most areas of the State will be unclassifiable for the revised standard. This will change over the next several years, as a new sampling network is phased-in.

RECOMMENDED AREA DESIGNATIONS

ARB staff evaluated the available ambient lead data to determine appropriate area designations throughout the State. The analysis was conducted for each monitoring site in the State for which data are available. Determining an area's designation is based on comparing measured lead concentrations, averaged for each three-month period, to the level of the standard. If the concentration (known as the design value or the highest rolling three-month average) is higher than 0.15 $\mu g/m^3$, it violates the federal standard and the area is nonattainment. The recommendations in this report reflect design values based on 2006 through 2008 ambient lead data.

Under the revised federal lead standard, there are three options for area designations:

- An area is nonattainment if the design value is greater than the standard;
- An area is attainment if the design value is equal to or less than the standard, and the data meet U.S. EPA completeness requirements;
- An area is unclassifiable if there are no monitoring data or if the monitoring data indicate attainment but do not meet EPA's completeness requirements.

U.S. EPA's final lead rule states that the presumptive boundary for a lead nonattainment area is the perimeter of the county associated with the sampler(s) violating the standard. The nonattainment area must include the area violating the standard, as well as the area with emissions sources contributing to the violations. In some cases, the nonattainment area may be larger or smaller than a county if analyses of sources and conditions show a different area is justified.

Based on ARB staff's technical analysis and ambient lead data for 2006 through 2008, ARB staff recommendations for lead designations are:

- The Los Angeles County portion of the South Coast Air Basin as nonattainment;
- Imperial County as attainment;
- All other areas of California as unclassifiable because they do not have sufficient data.

These recommendations are shown in Figure 2 and Table 1 and discussed in greater detail in the following pages.

FIGURE 2

Recommended Area Designations for the 2008 Federal Lead Standard

TABLE 1
Recommended California Area Designations for the Federal Lead Standard Based on 2006-2008 Air Quality Data

	Designated Area	*Design Value[1] ($\mu g/m^3$)*	*Area Included*
Nonattainment	South Coast-Los Angeles County	2.49	Air Basin portion of Los Angeles County
Attainment	Imperial County	0.03	Imperial County
Unclassifiable	Great Basin Valleys Air Basin	no data	Alpine, Inyo, and Mono counties
	Lake County Air Basin	no data	Lake County
	Lake Tahoe Air Basin	no data	Air Basin portions of Placer and El Dorado counties
	Mojave Desert Air Basin	no data	Air Basin portions of Kern, Los Angeles, Riverside, and San Bernardino counties
	Mountain Counties Air Basin	no data	Amador, Calaveras, Mariposa, Nevada, Sierra, Tuolumne, and Plumas counties and Air Basin portions of El Dorado and Placer counties
	North Central Coast Air Basin	no data	Monterey, San Benito, and Santa Cruz counties
	North Coast Air Basin	no data	Del Norte, Humboldt, Mendocino, and Trinity counties and Air Basin portion of Sonoma County
	Northeast Plateau Air Basin	no data	Lassen, Modoc, and Siskiyou counties
	Sacramento Valley Air Basin	no data	Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, and Yuba counties and Air Basin portions of Placer, Solano, and Yolo counties
	Salton Sea Air Basin (Remainder)	no data	Air Basin portion of Riverside County
	San Diego Air Basin	no data	San Diego County
	San Francisco Bay Area Air Basin	no data	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties and Air Basin portions of Solano and Sonoma counties
	San Joaquin Valley Air Basin	no data	Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties and Air Basin portion of Kern County
	South Central Coast Air Basin	no data	San Luis Obispo, Santa Barbara, and Ventura counties
	South Coast Air Basin (Remainder)	incomplete data	Orange County and Air Basin portions of Riverside and San Bernardino counties

[1]The design value is the highest rolling three-month average lead concentration for any site in the area based on data collected during 2006 through 2008. The area is nonattainment if the design value is greater than 0.15 $\mu g/m^3$.

Nonattainment Area

South Coast - Los Angeles County

The South Coast Air Quality Management District (District) has collected lead data at several sites in Los Angeles County for a number of years. Several of these sampling sites are located near lead-related facilities and were established as part of the District's Rule 1420 (Emissions Standard for Lead) that was adopted in September 1992. The purpose of Rule 1420 is to reduce lead emissions from non-vehicular sources. It applies to all facilities that use or process materials containing lead, including primary or secondary lead smelters, foundries, lead-acid battery manufacturers or recyclers, as well as facilities that produce lead-oxide, brass, and bronze. The samplers are located at or beyond the property line of the facility and comply with U.S. EPA siting and operating criteria. Lead samples are generally collected on a 1-in-6 day schedule, although samples are collected more frequently at sites with the highest concentrations.

Based on lead data collected during 2008 (when sampling began at the District's Exide Rehrig Pacific site), the maximum rolling three-month average for Los Angeles County is 2.49 $\mu g/m^3$. This value reflects the January through March 2008 three-month period and exceeds the 0.15 $\mu g/m^3$ federal lead standard. Because lead concentrations at the Rule 1420 samplers are associated with specific facilities, and lead concentrations drop off fairly rapidly with distance from the source, ARB staff recommends the nonattainment area be limited to the portion of Los Angeles County that is located in the South Coast Air Basin.

Attainment Area

Imperial County

Imperial County is located in the Salton Sea Air Basin. Lead sampling data are available for the Calexico-Ethel Street site which is located near the border between the United States and Mexico. Although ambient lead concentrations in the Calexico area may be impacted by lead emissions from cross-border mobile sources, at the time this report was written, it does not appear there are any significant non-vehicular sources located in the County. The Calexico lead data are complete for November 2005 through December 2008, and they show a design value of 0.03 $\mu g/m^3$ for the May through July 2007 three-month period. Because the data are complete for the three-year period and the design value is lower than the revised standard, ARB staff recommends Imperial County be designated as attainment for the federal lead standard.

Unclassifiable Areas

In addition to Imperial County and the Los Angeles County portion of the South Coast Air Basin, Table 2 includes a list of all remaining areas in California. ARB recommends these remaining areas be designated as unclassifiable for the revised federal lead standard. While nearly all these areas have no ambient lead data, some sampling data are available for sites in Riverside and San Bernardino counties in the South Coast Air Basin. Although the rolling three-month averages for these sites are lower than the federal standard, the data are not complete for the three-year period. As new samplers are deployed over the next two years, ARB will begin to build the database necessary for resolving these unclassifiable designations.

MONITORING REQUIREMENTS

As described earlier, the phase-out of lead in gasoline (except for limited aviation applications) and long-term attainment of the federal lead standard has been one of California's most dramatic success stories. Consequently, over time, the number of lead monitors has been significantly reduced in California and throughout the nation.

With the success of removing lead from gasoline, remaining lead emissions come from sources such as battery recycling, lead smelters, cement and glass manufacturing, metal mining and the use of non-leaded fuel in certain general aviation applications (but not in commercial passenger aircraft). Additionally, lead is a persistent pollutant that can end up in soil and dust, and re-enter the air, often many years after it was originally emitted.

To address this issue, U.S. EPA is requiring samplers near industrial sources emitting at least one ton per year of lead, and these samplers must be deployed by January 1, 2010 (*Note:* Although the current regulation specifies a one ton per year threshold, U.S. EPA is considering reducing the threshold to a lower level). ARB staff evaluated all of the available emission inventory databases, and worked with air districts to identify the industrial sources that would be subject to this monitoring requirement. At the time of the release of this Staff Report, the only region in California with sources subject to this requirement is the Los Angeles County portion of the South Coast Air Basin.

In conjunction with monitoring near industrial sources, the U.S. EPA is also requiring monitoring to track population exposure to ambient lead concentrations. Population-oriented samplers will be required by January 1, 2011, in each Core Based Statistical Area (CBSA) with a population of at least 500,000. CBSAs are defined by the U.S. Office of Management and Budget (OMB) for use by federal

agencies and are intended to provide nationally consistent definitions. A CBSA typically includes at least one urban area, as well as adjacent communities tied to each other through economic, employment, and commuting patterns.

There are 11 CBSAs in California that meet this population threshold, as shown in Table 2. Figure 3 shows which counties within these CBSAs currently have lead samplers and which additional counties might require sampling. ARB and the local districts, using U.S. EPA's monitoring criteria, will complete a more thorough evaluation to determine the best places to site these samplers before the 2011 deployment deadline. When data from these new samplers become available, they will be used to resolve some of the recommended unclassifiable designations.

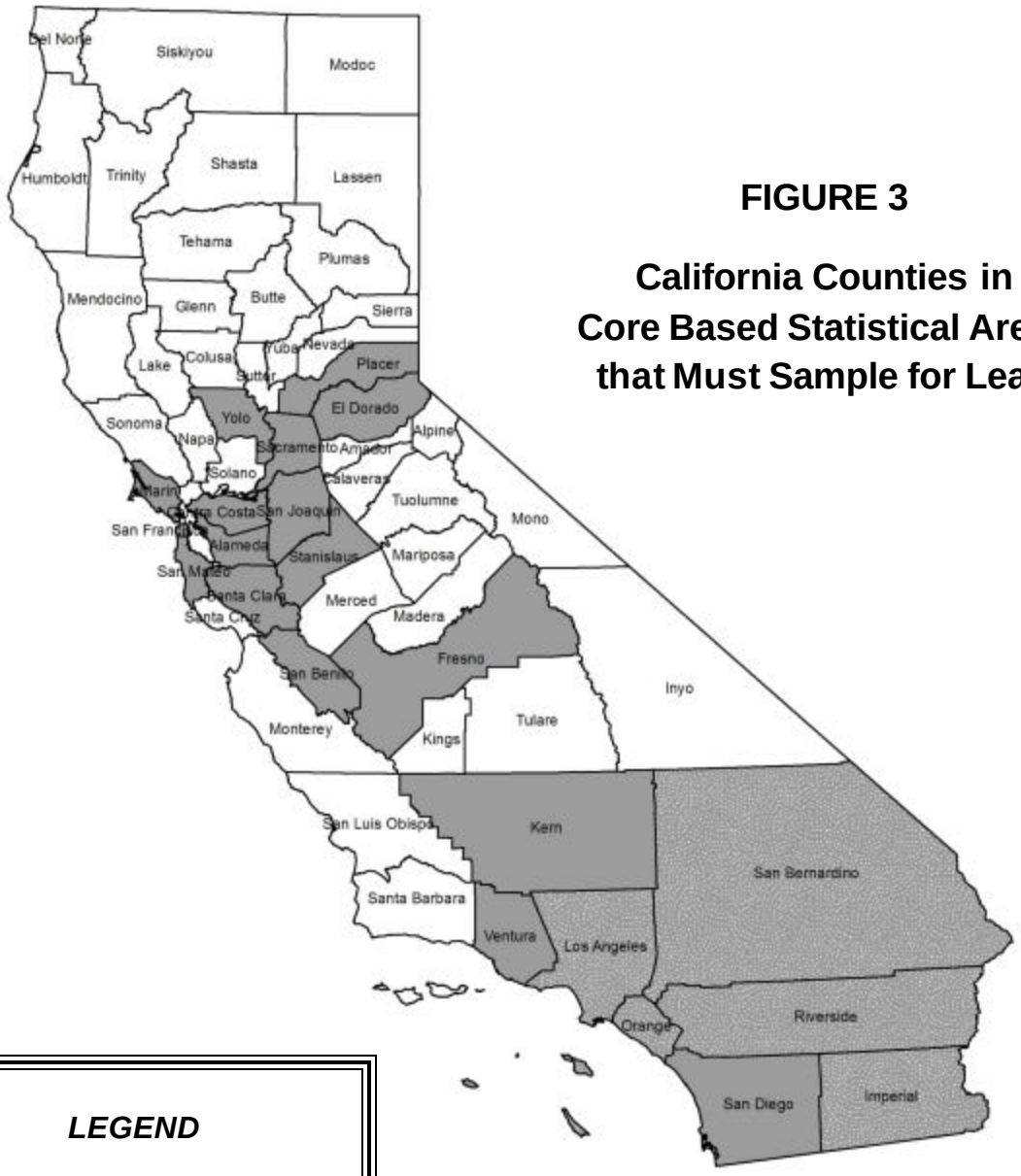
TABLE 2
Core Based Statistical Areas in California
with a Population of 500,000 or More

Core Based Statistical Area	***Counties Included***	***Population* (millions)***
Los Angeles-Long Beach-Santa Ana	Los Angeles and Orange	9.879
Riverside-San Bernardino-Ontario	Riverside and San Bernardino	4.081
San Diego-Carlsbad-San Marcos	San Diego	2.975
San Francisco-Oakland-Fremont	Alameda, Contra Costa, Marin, San Francisco, and San Mateo	2.484
Sacramento-Arden Arcade-Roseville	El Dorado, Placer, Sacramento, and Yolo	2.091
San Jose-Sunnyvale-Santa Clara	San Benito and Santa Clara	1.804
Fresno	Fresno	0.899
Oxnard-Thousand Oaks-Ventura	Ventura	0.798
Bakersfield	Kern County	0.791
Stockton	San Joaquin County	0.671
Modesto	Stanislaus County	0.511

* July 1, 2007 data provided by U.S. EPA.

FIGURE 3

California Counties in Core Based Statistical Areas that Must Sample for Lead



LEGEND

County in CBSA* that must sample for lead

County with existing sampler in CBSA that must sample for lead

** Refer to Table 2 for list of affected CBSAs*

SUMMARY

This report summarizes ARB staff's recommendations regarding area designations for the revised federal lead standard. It also discusses new lead monitoring requirements. ARB staff recommends the U.S. EPA designate the Los Angeles County portion of the South Coast Air Basin as nonattainment and designate Imperial County as attainment for the 0.15 $\mu g/m^3$ federal lead standard. Staff recommends that all other parts of the State be designated as unclassifiable because data are either incomplete or not available. These unclassifiable designations will be resolved over the coming years, as the lead sampling network is expanded.